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陕西蓝田柄杯鹿(*Lagomeryx*)的发現及其意义*

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一新柄杯鹿的发現

1964 年四月，古脊椎动物与古人类研究所蓝田調查队，从該县泄湖公社高坡村采得了一个保存相当完好的柄杯鹿化石。由于这一发現具有生物上和地层上的特别意义，特在本文加以描述。

柄杯鹿科 Lagomerycidae Pilgrim, 1941

柄杯鹿属 *Lagomeryx* Roger, 1904

复角柄杯鹿,新种 *Lagomeryx complicidens* sp. nov.

正型标本 一近于完整之右"角",野外号: 64004。本所化石編号为 V. 2780。

层位与地点 上中新統。陕西蓝田泄湖人民公社高坡村附近。

特征 角柄长而直，切面为椭圓形。接近眼孔处无基部。角頂掌状部由四个基本部分組成。但前枝又分为二,后內枝亦分为二,外枝分为三,只有內枝为一,共八叉。掌状部向前傾斜,椭圓形,中部微凸。

描述 由部分保存的眼孔位置和分叉的后內角部位判断，这一角应为右边的。根部只保存了眼孔部分約 22 毫米直长。根部无基节部的任何痕迹,角柄較长。前外从眼孔到掌状底 135 毫米。后內从根部到掌状底为 145 毫米。角柄很直,毫无弯曲,前內到后外較扁平，中部直径为 18 × 14 毫米。成一以前外部較窄，后內部較鈍的輪廓。骨面稍受磨蝕,但可以看出有沿骨干平行的条紋。

角頂端掌状部分，比任何已知的柄杯鹿都复杂。但可以明显看出，基本上由三部分(或四部分)組成。这几部分都是由柄頂端近根部分出的,和其他次分枝由距柄頂端較远处分出来的极不相同,这性質由掌状的腹面看的特别清楚。

第一主分枝(图 1,1)显然代表前枝,微向外，根部通至角柄前外稜的內側。它在距根部 14 毫米处分而为二,內側者較大,腹側尖端已破,外側者較小，尖部也殘缺，断面圓形。根部寬 29 毫米。

第二主分枝(也可以再分作二主分枝 2_1 和 2_2)，根部連接在一起,但 2_1 和 2_2 还是較清楚地分开。2_1 代表向外的一枝,尖端已破,但圓錐状的形状还可看出。这一枝在較近根部

* 6 月 27 日收到。

和 2_2 分开，几可当作独立的一枝。2_2 代表向后內的一主枝，但在距根部較远处又分而为二。前者較粗大，保存完整，后者較細小，尖端已破，但均呈圓錐形。2_1 及 2_2 根部均寬 20 毫米，两者根部寬为 36 毫米。

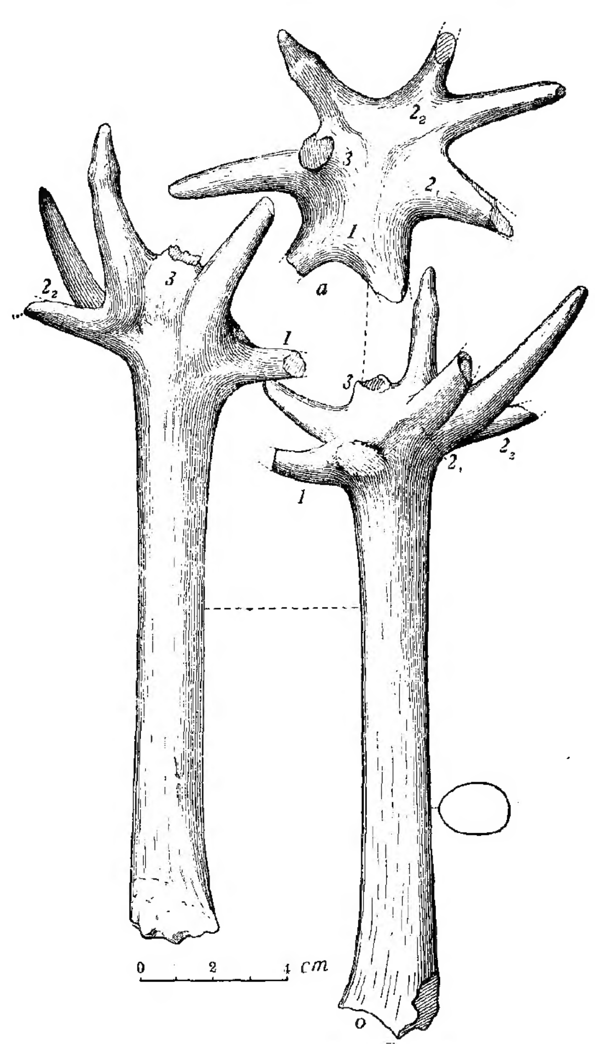


图1 复角柄杯鹿，新种。右角內視、外視及頂視，附茎部切面。*a*. 前面，*o*. 眼孔部，1—3 表示不同分枝。詳見正文，原大1/2。

Fig. 1, *Lagomeryx complicidens* sp. nov. A right "horn" in inner and outer views with palmature of the dorsal view and the cross-section of the shaft. *a*, anterior side; *o*, orbital border; 1—3 indicating the various branching of the tine. For details see text. 1/2 nat. size.

第三主分枝为代表向后外的一枝，在距根部約 15 毫米处又分为三枝，两边者較完整，中間者在距根部很近处破裂。完整的两分枝也作尖圓錐状。向后的一枝，在距尖端不远处作肿胀状，显然为病态发育（受伤而复愈）。中間破裂的疤距两边者距离差不多相等，所以应当看作是不属于任何一个的分枝。

由以上記述可以認为，这一掌状物一級的分枝应为三，二級的分枝应为一，而三級的分枝成为四，共八枝，如图一所示。这八个分枝所幅輳而成的掌状面約作圓形，沒有任何象涂氏皇冠鹿那样前后拉长之状。所成的面，后高前低，向前傾斜，远不如涂氏皇冠鹿和三叉柄杯鹿那样近于平坦，也不如辛氏柄杯鹿那样近于直的傾斜。各分枝的面几乎都是平滑的，仅有很輕的条紋状組織。在掌状体的腹側，特别是 3（有凹入部分）可以看出有和柄部相連的裂紋。

鉴定与討論 以上所描述的标本，应属柄杯鹿这一属似无疑問，因为它和这一属已知的种，同具有显然沒有脫落現象的角和长而附有或多或少复杂的分枝和掌状部分。

到目前为止，一共有五种已知的柄杯鹿，欧洲二，亚洲三，都是上中新統的。蓝田的化石和其他五种俱不相同，可列表于次（331 頁）。

以上列举的七个性質，多数可靠，少数乃根据原作者复原图判断（特别是 6 和 7），不一定可靠。但无論如何，蓝田标本和这些都有显著的区别。如果要找近似的种的話，当以通古尔的三叉柄杯鹿較为相近。和山旺的辛氏柄杯鹿相差最远，几无一性質相同。和柴达木柄杯鹿也有很大区别。和欧洲的两种除柄部較接近外，差别也不小。

	蓝田标本	*L. simpsoni* (Shanwang)	*L. tsaidamensis* (Tsaidam)	*L. triacumina-tus* (Tung Gur)	*L. meyeri* (Stätzling)	*L. praestans* (Chitenay)
1.柄 Pedicle	直 长 Straight and long	向后弯曲长 Curved and long	向前弯曲长 Curved and long	直 长 Straight and long	微弯长 Nearly straight and long	同 左
2.柄断面 Cross-section of the pedicle	較扁平 Compressed	圓 Circular	相当圓 Nearly rounded	? 同 左 Nearly rounded as judged by the figures of Colbert	較 圓 Rather rounded	同 左 Rounded
3.頂端分枝处占全长 Length of the palmated whole "antler"	小于 $\frac{1}{3}$ Less than one third	大于 $\frac{1}{3}$;德标本 $\frac{1}{2}$ More than $\frac{1}{3}$; Teilhard's specimen about $\frac{1}{2}$	—	非常大于 $\frac{1}{3}$ Largely more than $\frac{1}{3}$	約$\frac{1}{5}$ About $\frac{1}{5}$	非常大于 $\frac{1}{3}$ Largely more than $\frac{1}{3}$
4.上端分枝 Main forks	基本 4,共 8, Basically 4 with 8 branches	基本 2,共 3, (Young's specimen) 基本2,共 5 或6 (Teilhard's specimen)	4—5 依步林图 4—5 According to Bohlin's interpretation	基本 3,共 5 Basically 3 with 5 or more branches	Basically 3 with? 5 branches	基本 2 With 2 branches
5.次生分枝数 Number of secondary forks	3—4	1—2	?	1—2	1—2	1
6.整个角对于头的位置 Position of the whole "antler" to the skull	向后傾斜 Slanting moderately backwards	下部后傾,上部向上,甚至有向前趋势 Lower part slanting backwards while the upper part directs upwards and slightly anteriorly	?	向后傾斜 Slanting backwards	稍向后傾 Slightly backwards	向外向前 Anterolaterally
7.掌状部分对于角干的位置 Palmated part in relation to the beam	大約与干軸成 20° Moderately large ca. 20° to the axis of the beam	很小,几与干軸平行 Very small, almost parallel to the axis of the beam	小,稍向前傾 Small, seemingly slanting anteriorly	小,几与干軸垂直 Small, nearly perpendicular to the axis of the beam	同 左 Same as the preceding one	小,較向前傾 Small, rather oblique in position with the axis of the beam

由于掌状的特殊結构，再加上直长而較扁的柄，蓝田标本，应代表一新的柄杯鹿，其特性已見上。兹定名为复角柄杯鹿。

对于已知中国柄杯鹿的注释

在欧洲已知的两种柄杯鹿（*L. meyeri* 和 *L. praestans*）在此不拟具論。它們都比我們的較原始，掌状分枝也比較簡单。

中国已知的其他三种（蓝田标本除外），除通古尔标本外，均保存于本所，今乘研究之便，可作如下的注释。

1. 通古尔的三叉柄杯鹿 可述的不多，其主要掌状三叉大約相等，靠外一枝有次生分枝，实际上前部还有一主枝，幷具有分叉（在复原图上作三小枝）。应当說是一可靠的种。此种原归皇冠鹿属，作者本人及一些古生物学家均公認为归柄杯鹿属。

2. 柴达木的柄杯鹿 其原型标本，和可能归于这一种的标本，均在手边，經对照原記述加以比較，有如下的意見。

步林的361材料，据原作者称属于同一个体，但未能完全凑于一起，我把原材料对比一下，自不能有所怀疑，它的主干向前弯曲（凸面向前），幷称 *L. meyeri* 及其他种为向外（这在 Stehlin 的复原图上看不很清）。如果左右鉴定不錯的話，虽然柴达木标本和山旺 *Heterocemas* 的原型标本大小相近，也有弯曲，但前后恰相反。至于頂部掌状构造，相去更远，前者有小而向左右伸展的頂部，和山旺及通古尔見的均不相同，但和后者較近。和蓝田标本的广大而前后延伸的掌状頂部也不同，所以柴达木标本，应当代表一具有特性的种。至于上部分枝，步林当作五个，从一些零碎的分枝来看相当之长。最长的比蓝田最长的还长，和其他两种差不多，也可当作一特性。

3. 山旺的柄杯鹿 原来我所描述的异角鹿正型是很特殊的，当初初步所訂之系統，已由德日进改为和他所描述的新型相近，而一同列入柄杯鹿属。現在把所有山旺保存的鹿类标本加以比較（包括解放后胡长康 1957 年所描述的和新采而未描述的一些不完整的角干和角分枝），得出两个截然相反的看法。

一个看法是德氏所描述的标本，尽管照他所說和我原有标本相同，但还有一些显著的区别。如他的标本分枝在全长一半以下部分（全长为 220 毫米，柄部 97 毫米，正型全长 215 毫米，柄部 139 毫米，均为 2/3），幷非如他所說为三分之一的分枝部分。其次，正型标本，只有两个主分枝，单一者傾向前，有次分枝向后，一外一內，此在大体上和 Stehlin 的 *L. praestans* 有些相象，不过后分枝的分叉較高些，也很短。德氏所描述的标本，照他的解說为左側，那末他所謂下部破了的角显然朝外，而非朝前，且視为叉有次生分枝的。上部的三叉角（德氏照的 a、b、c 和原型极不相同。次生分枝很低，a 不能当作原型的次生分枝，相当两后枝，一內一外，倒可以相当于正型主枝。这显然不能照德氏所想，仅仅用年龄和个体变形来解释的。照这样的看法，德氏的标本应另作一种，不与正型相同。在这一种可能下，这个标本，至少应当作一新种。名为德氏柄杯鹿。

未描述的标本中，有一主干，也向后弯曲，比两者均稍細，另有更殘破主干，大小相同，还有三个分枝的末段。这些标本，可以归正型，或德氏的标本一型中，因材料太破，难作肯定。

把我 1937 年所描述而未能定出来的标本 (p. 226, Fig. 10, c and d) 和德氏的标本相比，倒可以认为 c 是相当德氏的图 a、b、c 部分 (a 殘缺)。不过掌状部稍寬一些，而分枝却短一些。至 d 却有可能相当于我原来正型的后上枝末梢部分，不过約大一半，应代表一較大的个体。

胡长康所描述的角，似乎不属于涂氏皇冠鹿 (見下)，但也不完全和德氏的标本相同。这个标本的三分枝在同一平面上，也沒有次生分枝，只有在下一解說下，才可能归于一种。

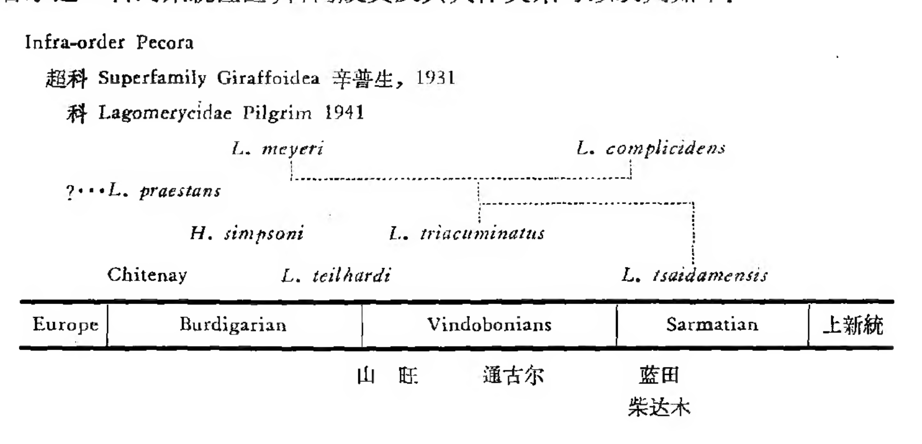
另外一个看法是，假設山旺的鹿化石是十分多变形的，不但如德氏所述，他的标本和原来正型标本，都是一种，而且連我原記述的 *Stephanocemas colberti* 也可归此种，支持这个說法的事实为两个角 (特别是正型图 10, a)。看来和德氏的标本的分叉处，也有些可比之处，前角低，后者高，其中有一斜的面。

两个看法相比，后者似难以成立，因其角干直而短，再加上还有基节部的痕迹，所以我們认为原来所定的 *Stephanocemas colberti*, 在分类上与目前所討論的柄杯鹿属完全不同。

关于柄杯鹿的系統位置

早在 1939 年德日进研究了山旺的标本以后，就提出应把中新統一些原始的鹿，包括柄杯鹿、原麂 (*Procervulus*) 列为一新科，但未給名称。1941 年皮克林 (1941, a. p. 136; 1941, b) 发展了这个概念，并建議用柄杯科 (Lagomerycidae) 这一名称。1945 年在辛普生的哺乳动物分类原理 (1945, pp, 158, 268) 中有一定保留地采用了这个办法，而把它列入于麒麟超科中。差不多同时的罗美尔脊椎古生物学教科书 (1945, p. 621) 却沒有这样做，而仍把柄杯鹿列入鹿超科中的古鹿科 (Palaeomerycidae)。新出版的法国古生物学大全第六卷偶蹄类部分把它列为亚科，但仍放在鹿超科的鹿科中。1962 年苏联所出古生物基础哺乳动物部分 (p. 342, 361) 把它当作一科，和鹿科与麒麟科并列，但在內容上无任何增加。多年以来材料并沒有什么增加，同时也反映出关于柄杯鹿的系統位置，还是一个未解决的問題。但是共同之点是都同意把柄杯鹿当作一科或亚科，以強調其系統上的位置。

蓝田发現的复角柄杯鹿，为近年来这一科唯一的新材料，而且化石保存完好。就这个标本看，角很直而較扁，杯状部与柄部无显著脫落的痕迹。我本人支持德日进、皮克林、辛普生等的做法，不但当作一科，而且认为其关系距麒麟科更近一些，应列入麒麟鹿超科之下。看来这一科的系統位置，科內成員及其大体关系可以表列如下：



由这表所示，只有辛氏亚角鹿和欧洲的 *L. praestans* 可以有关，其他亚洲三种都和欧洲的麦耶氏柄杯鹿可能有关。这样安排也表示：虽然这些含柄杯鹿化石的地层均归上中新統，但有可能山旺較老，通古尔次之，而蓝田和柴达木差不多同时。

应当指出，斯太林并不相信原始的鹿发現于亚洲而向欧洲发展 (*1937, p. 213*)，因之寇伯特的解释(*1940,* pp. 5—6)是多余的，以上的表只說明系統关系，絲毫不說明亚洲的种是从欧洲来的。我們对于中新統，特别是中下中新統和以前的化石知識还所知太少，有可能将来能如古鹿(*Archaeomeryx*)的那样，在中亚大量发現(如 1959 年)。也只有发現更多的古老柄杯鹿，才能說明問題。

关 于 皇 冠 鹿

由于最初把柄杯鹿和皇冠鹿当作一属(Colbert, 1936)以及两属在多数地点一同发現(通古尔、柴达木)所以在此討論一下皇冠鹿，看来不是多余的。至少就我国說，皇冠鹿分布較广，在地层上有特殊意义，也可以帮助进一步了解柄杯鹿。

通古尔的涂氏皇冠鹿 为这一属的典型种，材料也最完整，并且从幼到老的角均有代表，必然为一可靠的种，和 *L. triacuminatus* 共生。

柴达木和乐都的皇冠鹿 步林(步，p. 26, 108)在青海所找的皇冠鹿有两地点，一为柴达木(407)，三个标本，只有一个亲見(407，图 40—41)和 368 一个标本；一为青海湖东接近甘肃的乐都县(碾北县，原归甘肃省)一个标本。所有标本都为冠状部，其中三个腹侧的和角柄接触的"疤"可看出，尤以較完整的乐都标本，最为清楚。由此标本看，和通古尔 *S. triacuminatus* 有两显著区别，一为"疤"位于中心，而不是如后者靠近前端，二背側的平台部分也不如后者之前后拉长。407 那一标本，如考虑到后部已破，疤也較在中部。这一标本凸側破裂处，可能有一分枝。由这些性质看，青海的标本，似代表另一种，茲取名为青海皇冠鹿(*S. chinghaiensis* sp. nov.)。乐都发現皇冠鹿，十分重要，說明青海东部也有上中新統的存在，这和甘肃西部永登享堂附近含利齿猪地点，只不过一百公里左右，可以和甘肃系相比較。

山东临朐山旺的皇冠鹿 前已說过，寇氏皇冠鹿归之柄杯鹿的可能不大，那末它还是应当最接近于皇冠鹿，不过这个标本很特殊，主要为三主分枝，而前者位置較低，真正形成的掌状面很小。有兴趣的是两个标本都和柄部紧相連接。正型标本清楚的有基节部的雛型，副型标本虽然无瘤状突，但也有界限可寻。德日进(1939, p. 272 脚注)不承認这个基节部的存在，因而将它还归于柄杯鹿。但也可能不当作为殘存而是开始的基部。那就是应当比其它皇冠鹿更原始一些(簡单的冠部，支持这說法)。因为如上所述，这一种的柄是短的，很难归入柄杯鹿。

苏联东哈薩克斯坦的皇冠鹿 苏联东哈薩克斯坦扎依桑盆地(Zaisan)所发現的皇冠鹿(Беляева, 1949)，就所掌握的模型看，为一标准的皇冠鹿冠部，比柴达木的标本大，也稍大于通古尔的涂氏皇冠鹿，共有五分枝，但也沒有明显的前后拉长的冠状背面。是否为一新种，难以断定。无論如何这一属在中亚的发現是很有意义的。

以上四个皇冠鹿地点，其中三个是在中国，同产柄杯鹿。在通古尔，还有第三种，谷氏二角鹿(*Dicrocerus grangeri*)(另一种未命名)，二角鹿在柴达木似乎也发現有两种，但带有

間号，未肯定。此外还有?*Eostyloceros* sp.，和另一种鹿 Cervidae indet。柴达木盆地的化石地点分布与地质情況，至今还未見发表。尽管如此，可以認为照原作者的結論当作一个动物羣，而这一动物应为上中新統的可能性是特別大的，至少由皇冠鹿和柄杯鹿看来是如此。

关于皇冠鹿的系統位置，几乎一致認为归于麂亚科，无何問題。几乎所有已知的（寇氏皇冠鹿除外）皇冠鹿掌状部均脫落，清楚說明和鹿一样是脫落的。相反的所有比較完整的柄杯鹿（柴达木柄杯鹿，是破裂，非脫落），柄部与分枝部均連在一起（尽管还有相愈合的痕迹），說明是不脫落的。

以上文稿准备过程中，本所李传夔同志帮助搜集有关标本和文献，胡长康同志提出一些意見，应当致謝。

本文研究未包括有关牙齿在內，因为在有牙齿的地点，其共生情形还是不明确的。这个問題有待以后发現了角和牙齿連在一起的头骨后，才能一并解决。

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ON A NEW *LAGOMERYX* FROM LANTIAN, SHENSI

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DISCOVERY OF A NEW *LAGOMERYX*

In April 1964 a field party of IVPP under the leadership of L. P. Chia discovered a nearly complete "horn" of *Lagomeryx*. It was found from the vicinity N. E. of the village Kaopu of the Yehhu commune. Since this find is of two-fold interest both biologically and stratigraphically, it is described and discussed in the present note.

Family Lagomerycidae Pilgrim 1941

Genus *Lagomeryx* Roger 1904

Lagomeryx complicidens sp. nov.

Material: A nearly complete right "horn". Field number 64004; Cat. no. V.2780.

Horizon and locality: Upper Miocene, N. E. of Kaopu, Yehhu, Lantian, Shensi.

Diagnosis: Shaft of the "horn" long and straight with the cross-section oval. The palmate area composed mainly of three or four parts. Anterior one branching out into two. The same for the posterior inner one. The external main tine is re-divided into three. Only the inner one is not divided. Altogether eight branches. The palmate middle part is oval in outline and inclines slightly anteriorly with the middle somewhat convex.

Description: Judged by the partly preserved orbital border and the direction of the forked posterior inner tine, this horn is certainly to be interpreted as the right side. Only about 22 mm straight length of the orbital border at the base of the horn is preserved. No trace of burr is observed. The shaft is rather long, anterior externally from the border of the orbit to the base of palmate part, 135 mm; the posterior inner length, 145 mm. The shaft is perfectly straight without any trace of curvature. It is weakly compressed with flat anterio-inner and postero-external sides. Cross-section at the middle, 18×14 mm. The antero-external side is somewhat narrower than the broader posterior inner side. The surface of the bone suffered from erosion but rather fine, striations along the shaft are still observable.

The upper part of the "horn" is mostly complicated than any other known members of this genus. It is evidently composed of three (or rather four) parts. All the main parts are starting to branch at point quite near the base of the upper end of the shaft. They are easily distinguishable from the sub-forking which are branching far away from the shaft. This feature is clearly seen both in dorsal and in ventral sides.

The first main fork (Fig. 1., 1) represents evidently the anterior branch, little externally. The base of it lies a little at the anterior external ridge of the shaft. It forks into two sub-branches about 14 mm from the base, the inner one being larger and external one smaller. The ends of both are somewhat damaged. The cross-section of the outer one is circular while the inner one more flat. Breadth at the base, 29 mm.

The second main fork may be considered as two main forks, 2_1 and 2_2 in Fig. 1.

The base of it is firmly connected together but 2_1 and 2_2 are deeply separated. 2_1 represents the external branch, the tip of which is broken but it is clearly pyramidic in shape. It is separated from 2_2 rather near the root of the palmature, so that it may be considered as an independent branch. 2_2 represents the posterior inner branch. It is forked again at the point rather far from the base. The anterior one is larger and robust and the posterior one smaller and the tip is broken. Both are pyramidical. The base of 2_1 and 2_2 20 mm in breadth; base of both 2_1 and 2_2, 36 mm in breadth.

The third main branch represents the external one. At the point about 15 mm from the base it is divided into three sub-forks. The middle one is damaged while the other two are intact and also pyramidic. The posterior one shows pathological development as clearly indicated by the swollen near the tip. It was probably injured and then recovered in life. The middle one is situated almost at the midway and should be considered as an independent sub-fork. Breadth at the base, 37 mm.

According to the preceding description, the palmate part of the horn may be considered as composed of three main branches with one secondary branch and four tertiary ones. The area formed by the eight radiated branches at the middle of the palmature is nearly rounded in outline and not so strongly entended antero-posteriorly as in the case of *Stephanocemas thompsoni*. This palmature in slanting anteriorly not in nearly horizontal position as that of the named form and *Lagomeryx triacuminatus*. It is, however, not so steep as in the case of *L. simpsoni*. The surface of those branches is nearly smooth and only weakly marked by some striations. In the ventral side of the palmature, especially near 3, with excavated area, the faint trace of the separation of the shaft and the complex upper part is indicated.

DETERMINATION AND DISCUSSION

That the fore going described specimen belongs to the genus *Lagomeryx* seems beyond any doubt, because all the known members of this genus show the same non-deciduous antler, long shaft and more or less complicated forks with palmature.

There are five well known species of *Lagomeryx*, in Europe two and Asia three, all Upper Miocene. The specimen from Lantian differs remarkably from all the known forms as shown in the tabulated way in the Chinese text (p. 331).

Since some features are deduced from the reconstruction of various authors (especially 6 and 7), their actual value may be doubted. Nevertheless, it is clear that the Lantian specimen differs from all of them. It is somewhat closer to *L. triacuminatus* and far spart from *L. simpsoni*. It is also quite different from *L. tsaidamensis* and the European species.

For the sake of the complexity of the palmature of the "horn" in addition to the straightness and the weakly compressed nature of the shaft, we propose to name it as *Lagomeryx complicidens*, new species, the diagnosis of which is already given in preceding pages.

COMMENTS ON THE KNOWN CHINESE LAGOMERYXIDS

There is little to say about the European lagomeryxids. They are more primitive, geologically older and with much simpler branches of the tine.

With the exception of the Tun Gur specimens all the others are kept in the Museum of IVPP, so that it is possible to make some side by side comparisons.

As concerning the Tun Gur *Lagomeryx* we have little to add. In addition to the three main branches there is still an anterior one which is again divided into three small ones. This is certainly a well defined species.

Bohlin's type of *Lagomeryx tsaidamensis* (361) was found from one site and belongs to one single individual but failed to put the main parts together. The main shaft curves anteriorly, a fact quite different from all the others. Its size approaches that of the type of *Heterocemas* but the way of bending is quite different. The palmate part is small and extends transversally, a feature distinguishing also from all the known forms. It is also a well established species.

In Shanwang of Shantung, the question is more complicated. The type of *Heterocemas* is considered by Teilhard as the same as his specimen with more complicated tines. In 1957 C. K. Hu described another tip part of tine as belonging to *Stephanocemas thompsoni*. According to my present observation, it is clear that the two specimens (Teilhard's type and my type) are quite different from each other. In Teilhard's specimen the following features are evindent: 1, The lowest branch starts at the lower half of the whole tine complex and not at the upper one third as given by him (Whole length, 220 mm, Length of the shaft, 97; In the type of *Heterocemas*, Length, 215 mm. Length of the shaft, 139 mm.); 2, In the type of *Heterocemas* there are only two main branches, the single one directed anteriorly while the posterior one is re-divided: one externally and one posteriorly. Such construction is comparable with that of *L. praestans*, only the bi-fid part of our specimen lies much higher and shorter. 3, In Teilhard's specimen (According to him a left one) the lowest tine (his d) is directed apparently laterally and almost vertically situated. The other three branches (his a, b, and c) are quite different from that of ours. All these features cannot be simply explained the way of individual variation or polymorphism. It is very improbable to deduce the type of Teilhard from that of ours.

We feel it is more probable to consider Teilhard's specimen as a separated species for which we like to propose the name *Lagomeryx teilhardi*, new species. It may include the part of tine given by me in 1937, Fig. 10, c. and also C. K. Hu's specimen. The latter is larger and may represent an old individual. The fragments of tines collected recently are too poor for given a precise determination. Most of them are referable to *Heterocemas* rather than to *L. teilhardi*. The specimen given in my previous paper, Fig. 10, d may represent a bi-fid part of the posterior inner tine, but larger.

The wholly absence of an palmate area in *Heterocemas simpsoni* (in *L. teilhardi* it is incipiently indicated) suggests that the genus name *Heterocemas* may be retained as another genus of the family lagomerixidae for the primitive stage of development.

SYSTEMATIC POSITION OF LAGOMERYX

Following Teilhard's idea in 1939 Pilgrim erected the name lagomeryxidae under the super-family Giraffoidea. Simpson followed it in 1945 with some hesitation. In all the important latter works (Romer, 1945; Viret, 1962 and Orlov, 1962), it was considered either as a family or as a sub-family under the super-family cervoidea without, however, much new data concerning this interesting group. This shows also that the systematic position of the family is not yet settled.

The Lantian specimen is the only new material secured recently. It is well preserved with straight and compressed shaft and well developed palmature and subdivision of

tines, but no clear deciduous tine and consequently wholy absence of the burr. This seems to support the idea of Teilhard, Pilrim and Simpson in regarding the genus as the representative of an independent family and closer to Giraffoidea rather than to Cervidae. Its systematic position and relationship of various known forms are given in the Chinese text p. 333.

In doing so, it is clearly shown that only the *Heterocemas simpsoni* stands closer to the European *L. praestans* possibly also *L. teilhardi* and the other three may be related to *L. meyeri*. In this arrangement it is supposed that the various localities of the *Lagomeryx*-bearing Beds may not be exactly of the same age, although they are Upper Miocene in the broad sense. The Shanwang Series is older, then Tun Gur and Lantian and Tsaidam may be the youngest.

This systematic sketch does not mean at all that the Asiatic forms are derived and migrated from Europe. We know actually very few about the old cervids in the older strata of Asia. Some day we may find more rich remains of those forms in the Lower Miocene and Oligocene Beds like the Eocene *Archaeomeryx*-finds in 1959, so that we shall have better position to discuss this problem latter.

A REVIEW OF STEPHANOCEMAS

Since *Stephanocemas* and *Lagomeryx* were first considered as belonging to the same genus and both occured together (Tun Gur and Tsaidam), it is perhaps not out of place to discuss this interesting genus here. *Stephanocemas* is widely distributed and stratigraphically very interesting for helping us to understand better the remains of *Lagomeryx*.

Stephanocemas thompsoni Colbert is the type species of this genus. It is richly represented by many specimens of tines from young to old. It was found in association with *Lagomeryx triacuminatus* and *Dicrocerus grangeri*.

The *Stephanocemas*-remains from Chinghai described by Bohlin. P. 26 and 108 are based on specimens of two localities, one is Tsaidam proper and the other is Lotuhsien, E. Chinghai. As judged by the figures given by the author they are quite different from those of Tun Gur. First, the scar left by the shaft lies nearly at the center (in *S. thompsoni* it is more anteriorly); Second, the palmate part is not so antero-posteriorly elongated as in the case of the Tun Gur species. The branches of the tines appear also simpler. The Chinghai specimen is most probably a new species for which we propose to name it as *Stephanocemas chinghaiensis* new sp. with the Lotu specimen as the type. The discovery of the genus *Stephanocemas* from Lotu is very interesting, suggesting that the Upper Miocene Beds are developed in the most eastern part of Chinghai and quite near (about 100 km) the *Listrodon*-bearing Upper Miocene Beds at Hsingtang, Yungteng, W. Kansu.

Concerning the *Stephanocemas colberti*, as we have noted before, it is very improbable that it belongs to *Lagomeryx*. It is more probable a true *Stephanocemas*, by its short shaft and many other characters. It is more primitive than the other species.

This genus is also recorded in Zaisan Basin of Central Asia. As judged by the cast, it is a typical *Stephanocemas*, larger than that of Tsaidam and smaller than that of the Tun Gur species, with five branches. There is no distinct elongated surface at the dorsal side of the palmature.

Among these four localities of *Stephanocemas* (actually five) three (four) are known in China, all associated with *Lagomeryx*. In Tun Gur there are two forms of *Dicrocerus*.

In Tsaidam there are also some other kinds of Cervids found in association. The geological condition and the distribution of the fossils from Tsaidam are still not available. We can only agree with Bohlin's conclusion that the fauna of Tsaidam represents a single faunistical unit. He considers it as Pontian in age. But at least from the study of the *Stephanocemas* and *Lagomeryx.*, it seems more probable that it is Upper Miocene in age.

There is no divergent opinion concerning the systematic position of *Stephanocemas*. All authors agree to put it under the sub-family Muntiacinae. With the possible exception of *S. colberti* (although with faint development of burr) all the forms with deciduous antler, are a sharp contrast to that of *Lagomeryx*.